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MICROMATIC

Microhoning and Microflat

EQUIPMENT *Catalog*

PRECISION PRODUCTION THROUGH MICROHONING
MICRO MATIC
TRADE MARK

MICROMATIC HONE CORPORATION, DETROIT 38, MICHIGAN

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For the past 25 years Micromatic has been expanding every phase of its operation—plant, personnel, research—while maintaining its top position in the honing field.

Basically, Micromatic offers you an engineering service, rather than a standard line of equipment. Its machines, tools and fixtures are designed to do a specific job. This approach has helped Micromatic to initiate every major honing improvement in the last two decades.

Its research and equipment-building plans are based on the needs of industry, with which Micromatic field engineers and designers are constantly in touch. Many Microhoning* advances, both in technique and equipment, are the direct result of working with the processing engineers in hundreds of industrial plants.

As a result of its experience in specializing and developing a complete line of facilities, capable of producing equipment to Microhone any type of part, Micromatic has established a policy of accepting full, undivided responsibility for every installation. Both the equipment and the results of the process are guaranteed. The Micromatic field engineer supervises the installation, conducts trial runs, and trains the operators. Every phase leading to the highest operating efficiency is covered.

*Registered, U. S. Pat. Off.

ADVANTAGES OF MICROHONING

In choosing the Microhoning process and equipment you are availing yourself of the most precise and productive machines, tools, fixtures, and abrasives obtainable for any honing application.

From the first contact by the field engineer in helping you determine your honing needs, to the realization of the full potential of the equipment, Micromatic's undivided responsibility assures you of complete satisfaction.

Microhoning offers you these other advantages:

- Any machineable material and many materials considered unmachineable can be Microhoned. These include all types of cast iron and steel, all non-ferrous metals, ceramics, glass, and some plastics. Microhoning removes stock also from the hardest steel (heat treated as high as Rockwell C72).
- The abrasive is self-sharpening. There is no interruption in the Microhoning cycle to dress the abrasive.
- Any desired degree of surface finish is developed.
- The surface pattern is consistently duplicated from work piece to work piece.
- Microhoning produces a surface that is clean—free of torn, burned or smeared metal that might flake or wear off quickly.
- The cross-hatch pattern provides a multitude of diamond-shaped plateaus that distribute the load.
- Each plateau in the pattern is bounded by valleys that act as oil reservoirs, and facilitate the dissipation of heat.

Machine Work Capacity

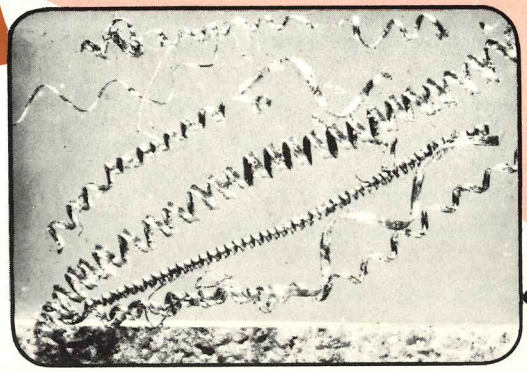
In order to present more accurately the capacities of various machines, several work-capacity charts have been compiled. They are guides only. Their main purpose is to show that the machines have, in certain instances, a capacity greater than is evident in "average" applications. Representative only of what has been designed for certain jobs under certain conditions, the equipment illustrated should not be regarded as "standard".

Because each piece of equipment is designed to do a specific job, several machines may appear in the same work-dimension category. This "seeming" overlap occurs because of physical differences in the work pieces. The hardness of the material, the over-all shape of the work piece, the ratio of length to diameter, the amount of stock to be removed, the condition of the work surface to be Microhoned, plus other production variables . . . determine which machine design is best adapted to do the job, even though the work-surface dimensions may be the same.

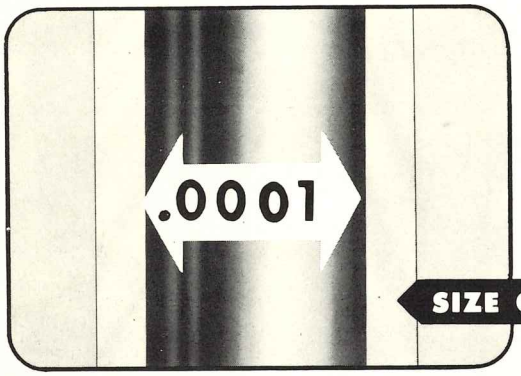
The proper recommendation, with individual engineering, is best made by the Micromatic Field Engineer, in conjunction with the Proposal and Design Engineering Departments.

MICROHONING = STOCK REMOVAL + GEOMETRY + SIZE CONTROL + SURFACE FINISH

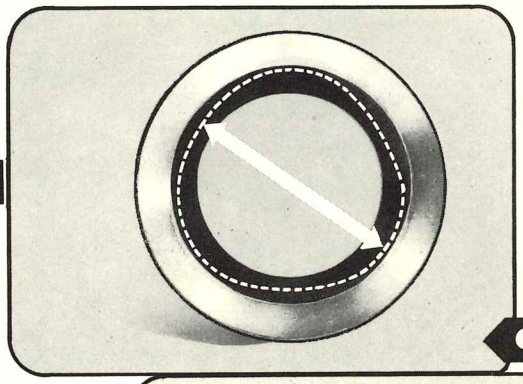
The Microhoning Formula Applied to Cylindrical Surfaces



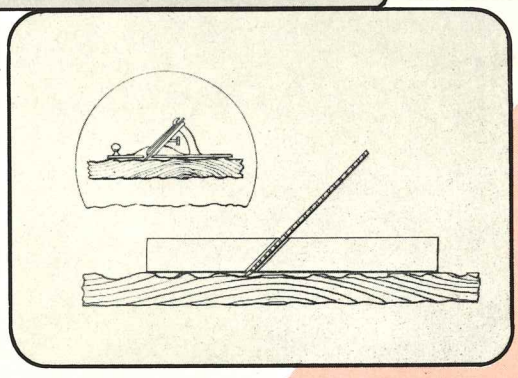
STOCK REMOVAL

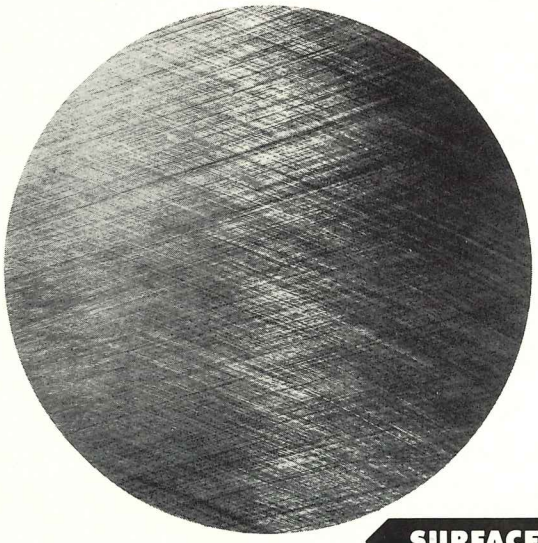


SIZE CONTROL



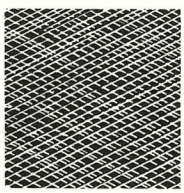
GEOMETRY



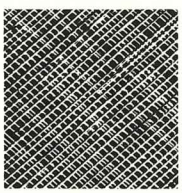


SURFACE FINISH

23° cross-hatch angle



55° cross-hatch angle



85° cross-hatch angle

Because the cross-hatch angle can be varied, the "lay" . . . the direction of the predominant surface pattern . . . presents a wide choice.

STOCK REMOVAL

Microhoning is essentially a shearing process. The magnified illustration shows chips sheared from a steel cylinder. Although the size of the chip depends upon the material, the thousands of grits in the abrasive cut simultaneously over a relatively large area, removing substantial amounts of stock. Since the abrasive is self-sharpening, cutting efficiency is maintained throughout the full Microhoning cycle. These principles, plus the use of a coolant, prevent localized heat from injuring or distorting the surfaces.

GEOMETRY *(Roundness and Straightness)*

Roundness is generated, correcting distortion caused by heat treating or previous machining operations. The large area of contact between the abrasive and the work piece, plus the controlled-expansion pressure, stabilize the tool so that the stones cannot follow the irregularity of the surface. Only the high spots are removed until the full surface is concentric with the center line.

In developing straightness, the long stones act like a carpenter's plane, bridging the low spots and shearing off the top of the waves. Because of the positive pressure, the stones are kept from backing up or tipping as they enter a tight area in the bore. Here, the cutting is greatest until these areas are leveled off.

*REGISTERED, U. S. PATENT OFFICE.

SIZE CONTROL

Because stock is removed efficiently with a minimum amount of heat and distortion, final size is more readily controlled. With the use of Micromatic adjusting heads the operator has complete control of the tool expansion; he can accurately control the amount of stock removed. Tolerances within .0001 of an inch are readily obtained.

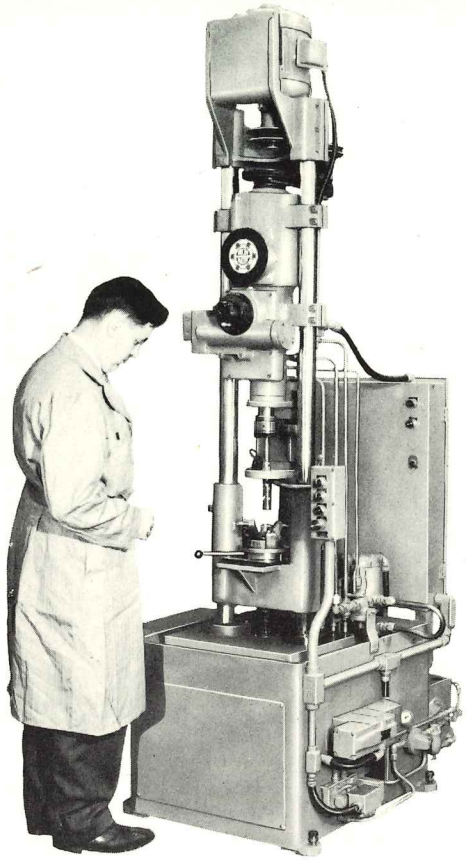
Microsize control (p. 15) automatically provides gaging of the bore during the Microhoning cycle, and a means of stopping the operation when the desired size is reached.

SURFACE FINISH

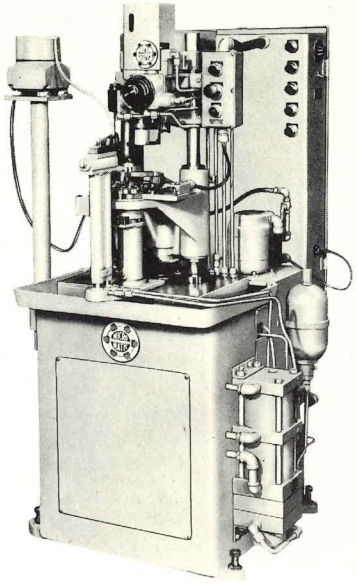
Although the roughness of a surface may vary in requirements, the designated degree of finish must be consistently held . . . whether it is an anti-friction bearing calling for a highly refined surface, or a bearing surface (such as a cylinder bore) which requires a controlled roughness. Microhoning's cross-hatch pattern, which angle can be adjusted to suit any type of application, produces minute valleys that improve lubrication during the break-in period and help to prevent scoring. Surface finish from 1 to 100 microinches may be developed.

Because the abrasive is self-sharpening there is no smear or distortion of the material. The tiny numerous cutting edges of the grits do not leave any amorphous (i.e., without regular internal structure) metal on the surface. Not only is there uniformity over the entire surface, but the Microfinish* is duplicated in every part.

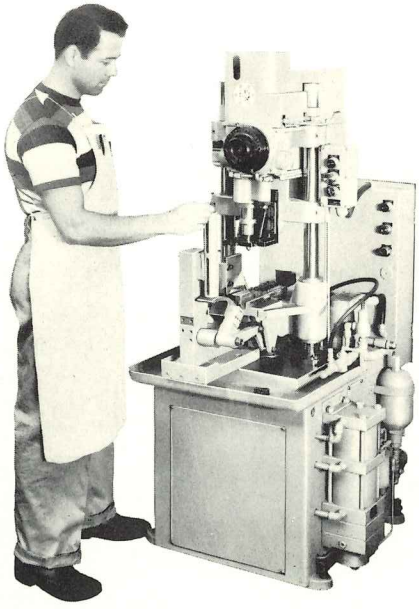
MICROHONER MACHINES



MODEL 736



MODEL 739



MODEL 738

These mechanical stroke machines have the speeds and controls required to Microhone short bores. The self-contained head unit is supported by two bars and is automatically splash-lubricated. Only the spindle driveshaft reciprocates and rotates, both motions being powered by one motor. Stroke length is easily adjusted by setting to a graduated scale.

Supported by the same bars that carry the head is the saddle on which the fixture is mounted. This saddle has a six-inch drop-away from the Microhoning position, making it possible, in certain applications, to Microhone a part that is longer than the stroke of the machine.

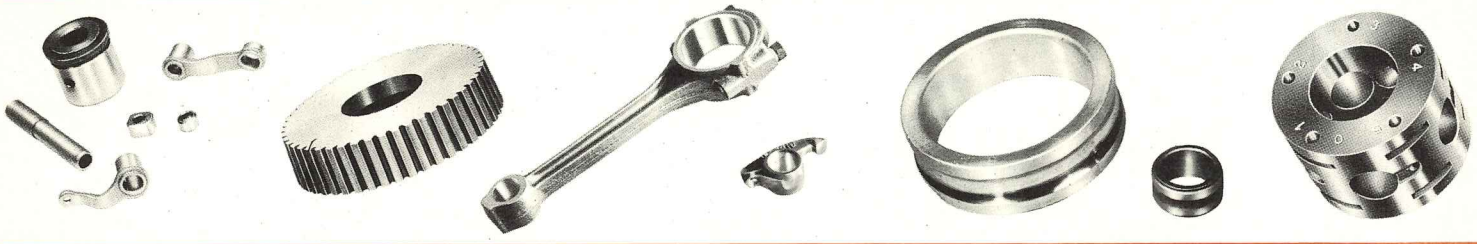
The 736 model is designed to give maximum rigidity and stability to the tool, and is particularly adaptable to short bores that require bore-to-face squareness.

The smaller 738 and 739 models find their greatest application on small diameter parts.

Models 736 • 738 • 739

Guide Specifications

	736	738	739
Overall H x W x L, inches	100x33x40	65x31x35	60x31x35
Base Height, inches	25	25	31
Spindle Stroke, inches	2	3	1
Fixture-Bar Clearance, inches	9¼	11	8
Head Motor, H.P.—R.P.M.	1½—1200	½—1200	¼—1800
Coolant Tank Capacity, gal.	10	8	8
Net Weight, lbs.	2800	1150	1000

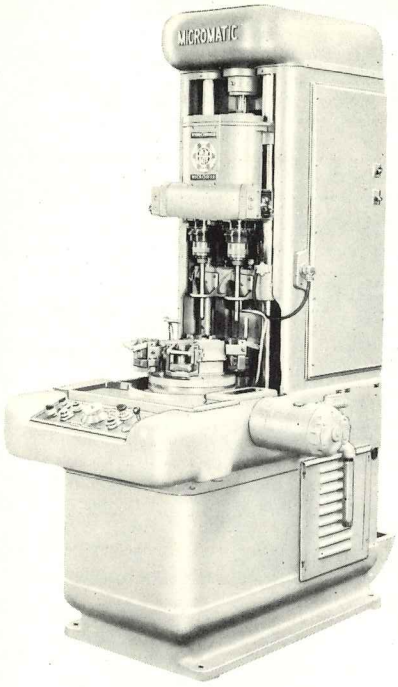


WORK CAPACITY CHART ★ Models 736 • 738 • 739 Machines

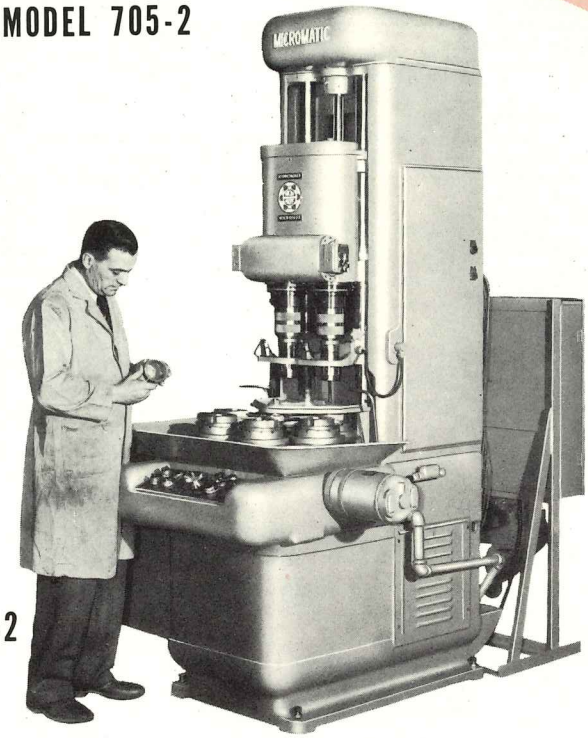
BORE LENGTH / BORE DIAMETER

Inches	.070	⅛	¼	⅜	½	¾	1	2½	3	3½	4	4½	5	6
⅛	739	739	739 738	739 738	738 736	738 736	738 736	736	736	736	736	736	736	736
¼	739	739	739 738	739 738	738 736	738 736	738 736	736	736	736	736	736	736	736
½		739	739 738	739 738	738 736	738 736	738 736	736	736	736	736	736	736	736
¾			739 738	739 738	738 736	738 736	736	736	736	736	736	736	736	
1			739 738	739 738	738 736	738 736	736	736	736	736	736	736		
1¼			739 738	738	738 736	738 736	736	736	736	736	736			
1½			738	738	738 736	736	736	736	736	736				
2			738	738	738 736	736	736	736	736					
2½			738	738	738 736	736	736	736						
3			738	738	738									

DOUBLE SPINDLE HYDROHONERS • Models 705-2 • 710-2



MODEL 705-2



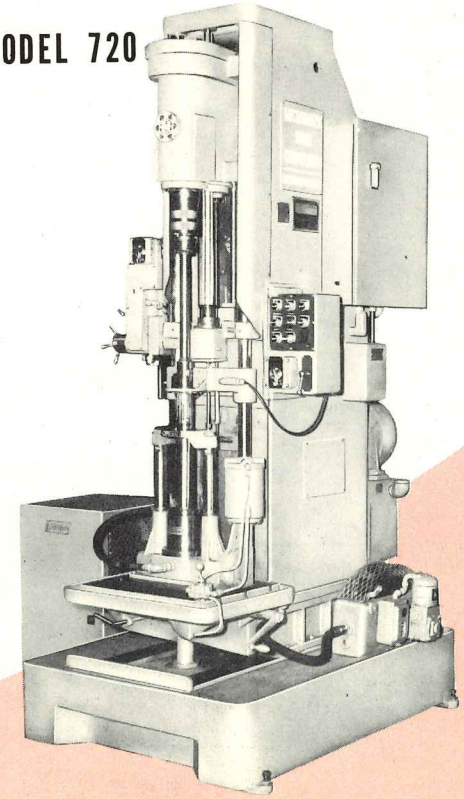
MODEL 710-2

Equipped with electronic Microsize controls, these double-spindle, high-production machines may have either a rotary indexing table or an automatic loading and ejecting fixture. The operation of the machine is automatic and may be set up to finish two parts simultaneously or one part progressively.

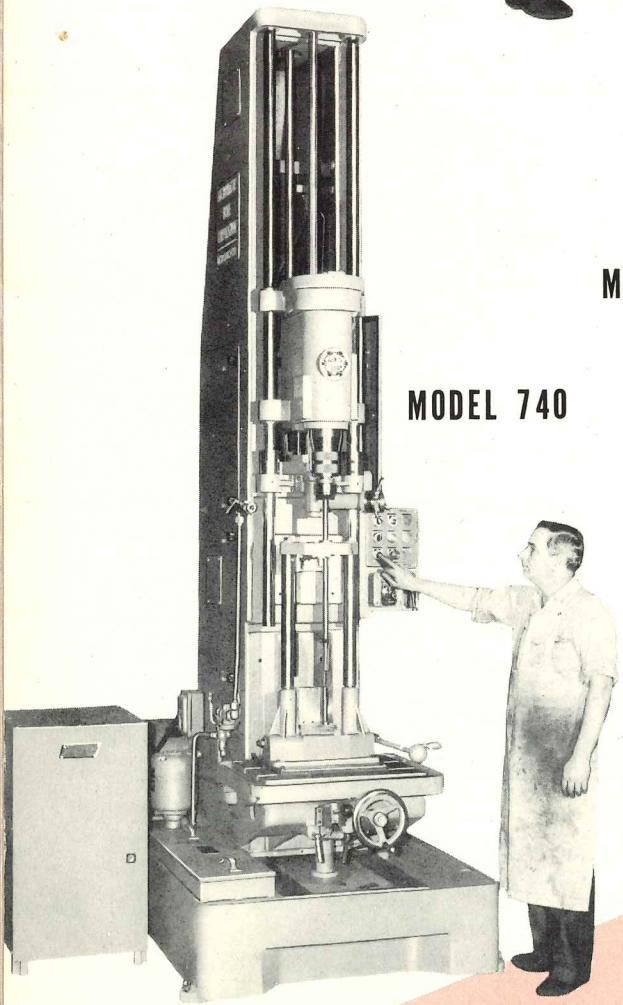
Parts that require both heavy stock removal and a fine finish are usually set up for progressive honing. Most of the stock is removed by the first spindle, using a coarse abrasive. The part is then indexed to the second spindle where final size and finish are generated.

LONG STROKE VERTICALS • Models 720 • 740

MODEL 720



MODEL 740



Designed primarily for long bores, these models permit a vertical set-up of work parts having a high ratio of bore length to diameter. Since any type of table can be mounted on the base, a wide variation of applications is possible. (Model 740 is shown with a raising and lowering, lateral-indexing table.)

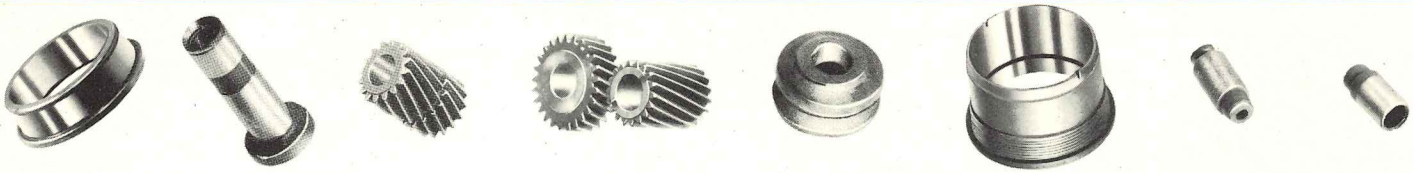
The tool is expanded by a remote control which is conveniently located within easy reach of the operator at all times.

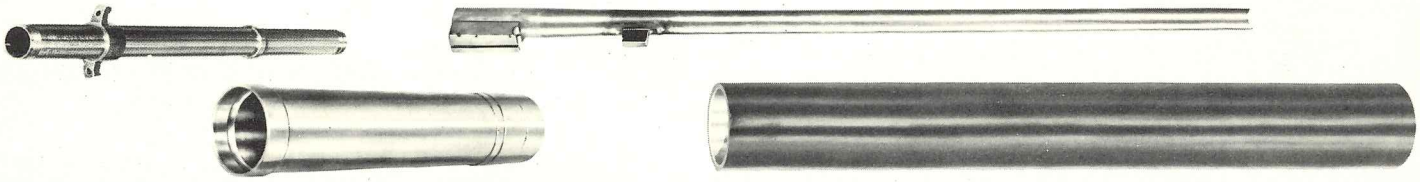
Guide Specifications 710-2 • 705-2

	710-2	705-2
Over-all H x W x L, inches	100x30x56	88x30x56
Base Height, inches	29	29
Head Stroke, inches	10	10
Spindles, C to C, inches	8	6½
Spindle Motor, H.P.—R.P.M.	2—1200	2—1200
Hydraulic Pump Motor, H.P.—R.P.M.	3—1200	3—1200
Index Table Motor, H.P.	¼	¼
Hydraulic Oil Capacity, gal.	24	24
Coolant Tank Capacity, gal.	30	30
Net Weight, lbs.	6000	5000

Work Capacity Chart

BORE LENGTH / Inches	BORE DIAMETER ¼	⅜	½	¾	1	1¼	1½	2	2½	3
¼		705	705	705	705	705	705			
½		705	705	705 710	705 710	705 710	705 710	710	710	710
¾	705	705	705	705 710	705 710	705 710	705 710	710	710	710
1¼	705	705	705 710	705 710	705 710	705 710	710	710	710	710
3	705	705	705 710	705 710	705 710	710	710	710	710	710
4		705	705 710	705 710	710	710	710	710	710	
5		705	705 710	710	710	710	710	710		



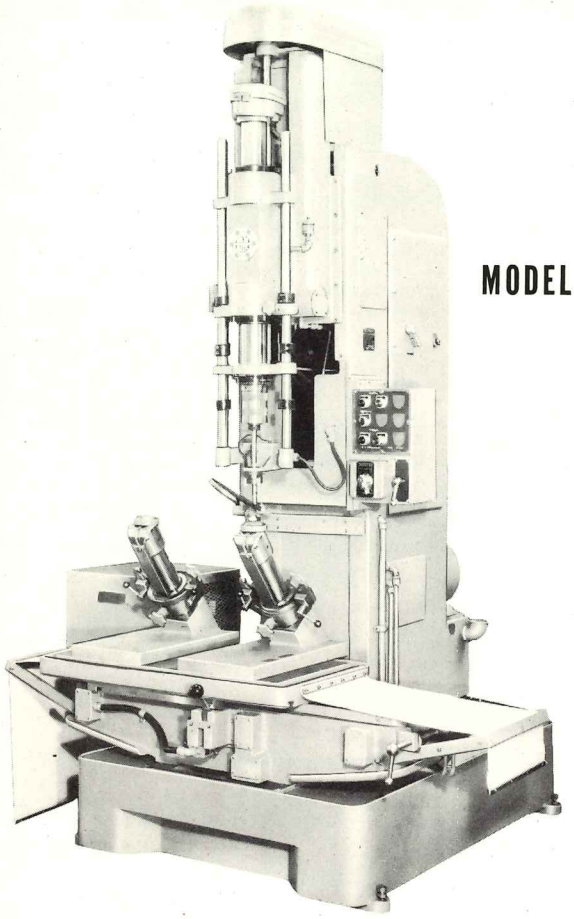


Guide Specifications 740 • 720

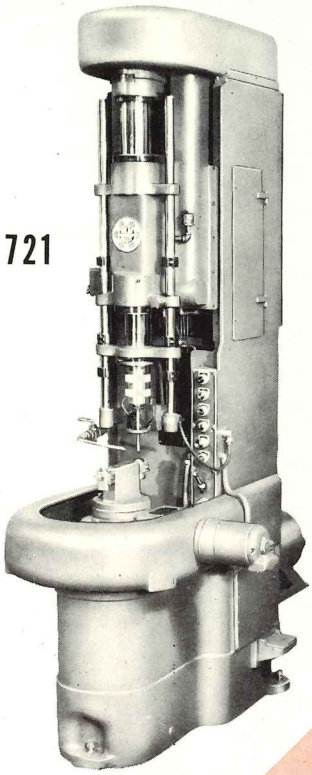
	720	740
Work Capacity Diameter, inches	½ to 4	½ to 4
Work Capacity Length, inches	Up to 15	Up to 35
Head Stroke, inches	20	40
Clearance, Spindle to Column, inches	8¾	8¾
Over-all H x W x L, inches	106x44½x60½	138x44½x60½
Base Height, inches	13⅛	13⅛
Motor Spindle, H.P.—R.P.M.	3—1200	3—1200
Motor, Hydraulic Pump, H.P.—R.P.M.	5—1200	5—1200
Hydraulic Oil Capacity, gal.	25	25
Coolant Tank Capacity, gal.	60	60
Net Weight, lbs.	6500	7000

SINGLE SPINDLE HYDROHONERS

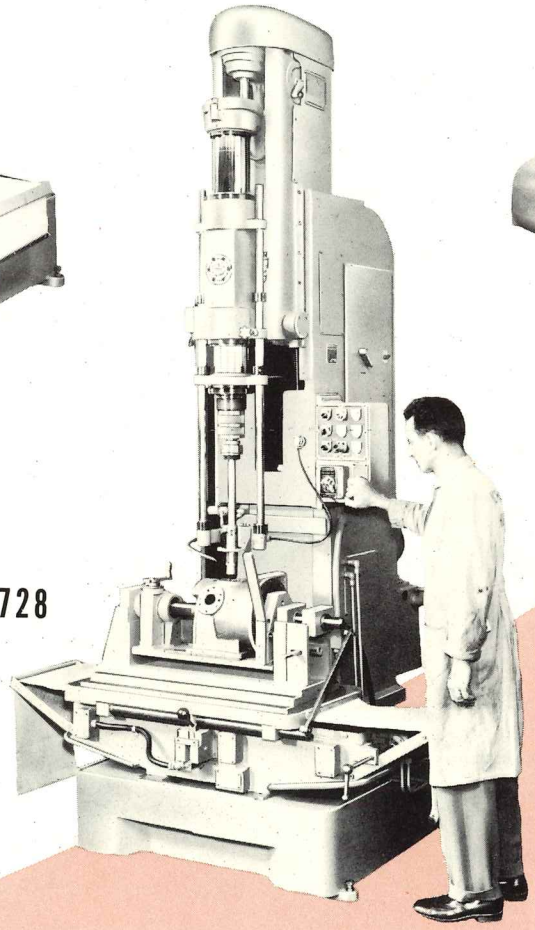
MODEL 723



MODEL 721



MODEL 728



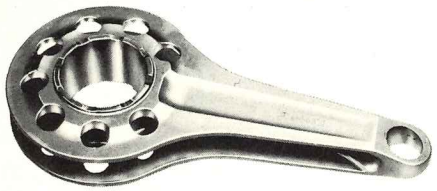
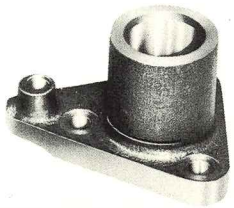
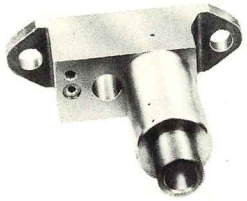
The unit-constructed spindle-in-quill feature permits heavier stock removal more easily than most machines of comparable size, since much of the torque is taken along the center line of the spindle.

Models 723 and 721 are mechanically the same, differing only in the base and column design. The latter model is mounted on a cast iron base designed for a rotary indexing table or stationary fixture. Models 723 and 728 may be equipped with any type of riser block, or with a lateral or rotary indexing table.

Models 721 - 723 - 728

Guide Specifications
721 - 723 - 728

	721	723	728
Quill Stroke, inches	10	10	12
Clearance, Spindle to Column, inches	9¼	12	12
Over-all H x W x L, inches	104x49x68	108x44½x60½	126x44½x60½
Base Height, inches	29	13⅛	13⅛
Spindle Motor, H.P.—RPM	1—1200	1—1200	3—1200
Hydraulic Pump Motor, H.P.—RPM	3—1200	3—1200	5—1200
Hydraulic Oil Capacity, gal.	30	25	25
Coolant Tank Capacity, gal.	25	60	60
Net Weight, lbs.	4500	4700	5700

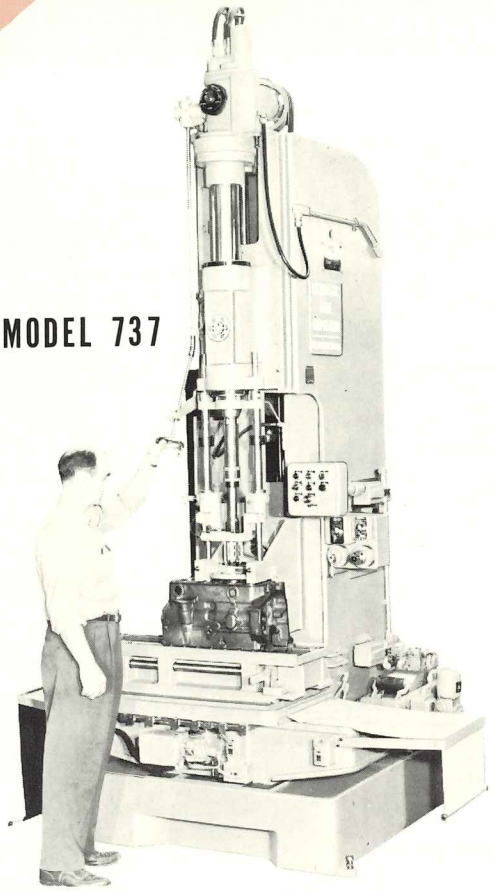




WORK CAPACITY CHART
Models 721 · 723 · 728

BORE LENGTH Inches	BORE DIAMETER ¼	¾	1	1¼	1½	1¾	2	2½	3	3½	4	4½	5	6	8	10	12
¾	721 723	721 723	721 723	721 723	721 723	721 723	721 723	721 723	721 723	721 723 728	728	728	728	728	728	728	728
1¼	721 723	721 723	721 723	721 723	721 723	721 723	721 723	721 723	721 723 728	728	728	728	728	728	728	728	728
1½	721 723	721 723	721 723	721 723	721 723	721 723	721 723	721 723 728	728	728	728	728	728	728	728	728	
2	721 723	721 723	721 723	721 723	721 723	721 723	721 723 728	728	728	728	728	728	728	728	728		
2½	721 723	721 723	721 723	721 723	721 723	721 723 728	728	728	728	728	728	728	728	728			
3	721 723	721 723	721 723	721 723	721 723 728	728	728	728	728	728	728	728	728				
4	721 723	721 723	721 723	721 723 728	728	728	728	728	728	728	728	728					
5	721 723	721 723	721 723	728	728	728	728	728	728	728	728						
6	721 723	721 723	721 723	728	728	728	728	728	728	728							
7	721 723	721 723	728	728	728	728	728	728	728								
9			728	728	728	728	728	728	728								

HEAVY-DUTY HYDROHONERS

MODEL 737



Model 737

This spindle-in-quill type machine productively combines rapid stock removal with high precision. The tool is attached directly to the drive shaft, with tool expansion being controlled through a hydraulically-actuated adjusting head on the upper end of the quill. Abrasive feed-out is positive and direct. This model may be equipped with any type of stationary or indexing fixture, and set up for either manual or automatic operation (with Microsize).

Models 420 - 430 - 450 - 470

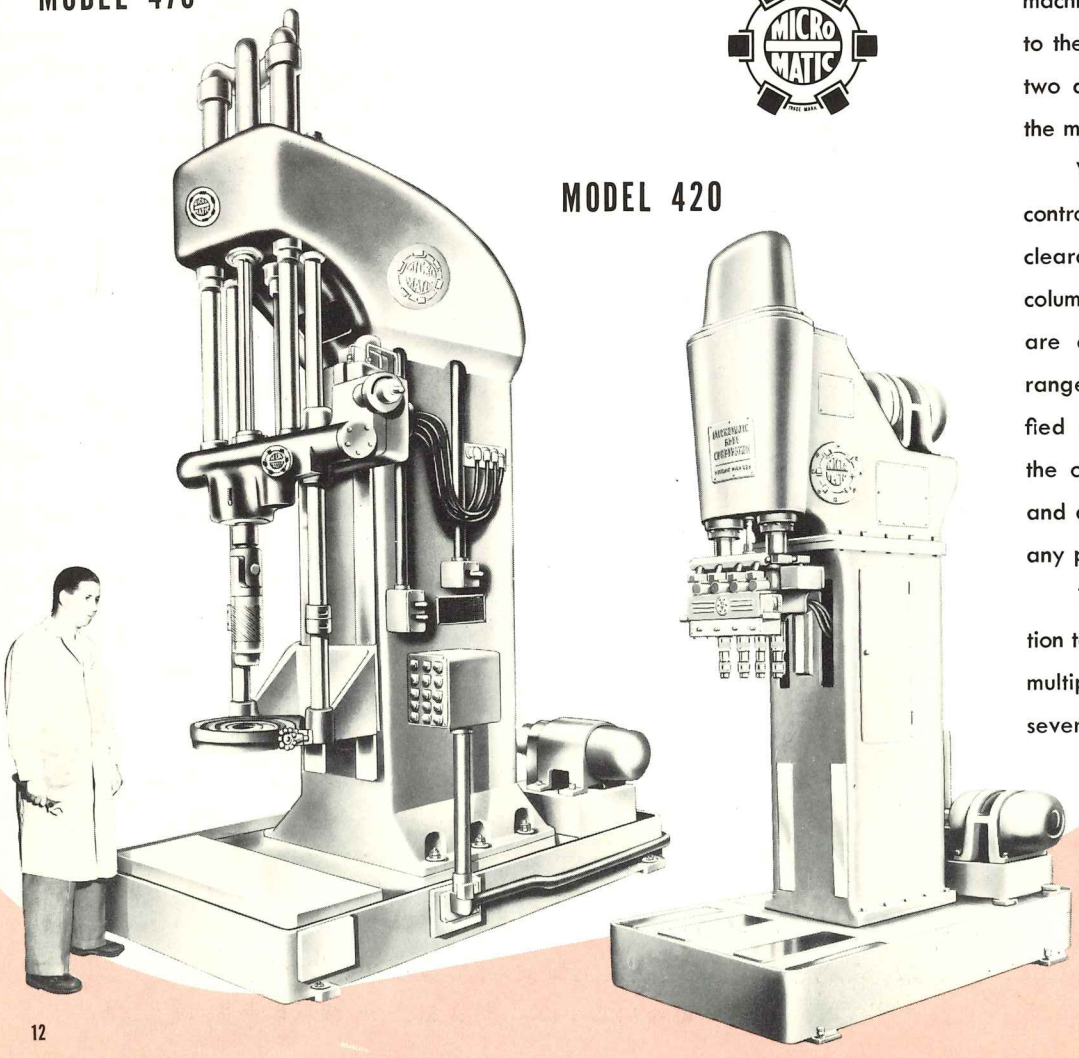
Designed for large diameter bores and heavy stock removal, these machines are the most recent additions to the heavy-duty vertical line. The last two digits of model number designate the maximum length of stroke.

With an eight-speed transmission controlling rotation and with 21 inches clearance between the spindle and the column, the 430, 450 and 470 machines are capable of Microhoning a wide range and variety of parts. The simplified stroke control mechanism permits the operator to set the stroke quickly and accurately and to "short stroke" at any point in the bore.

The 420 model brings high production to the heavy-duty line. Designed for multiple-spindle Microhoning, it can finish several bores in one cycle.

MODEL 470

MODEL 420

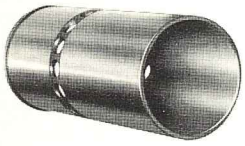
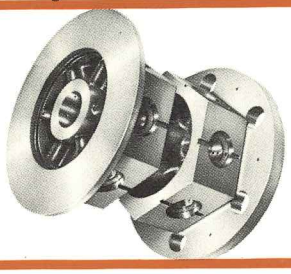


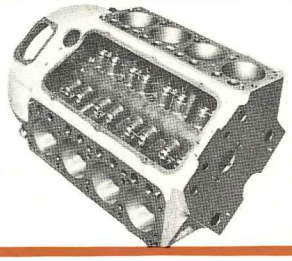
Guide Specifications

737 · 420 · 430 450 · 470

	737	420	430	450	470
Maximum Stroke, inches	12 or 16	20	30	50	70
Clearance, Spind. to Col., (inches)	14	16	21	21	21
Over-all H x W x L, (inches)	152x47x81	180x60x90	186x60x95	226x60x125*	266x60x125*
Base Height inches	13⅛	16½	14	14	14
Spindle Motor, HP—RPM	5—1200	25—1800	15—1800	15—1800	15—1800
Hyd. Pump Motor; HP—RPM	5—1200	10—1200	10—1200	10—1200	10—1200
Hyd. Oil Cap., gal.	30	30	30	30	30
Coolant Tank Cap., gal.	60	110	110	110	110
Net Weight, lbs.	9600	15,000	12,000	12,500	13,000

**Including in-and-out table; without table, length is 95 inches.*



WORK CAPACITY CHART
Models 737 · 430 · 450 · 470

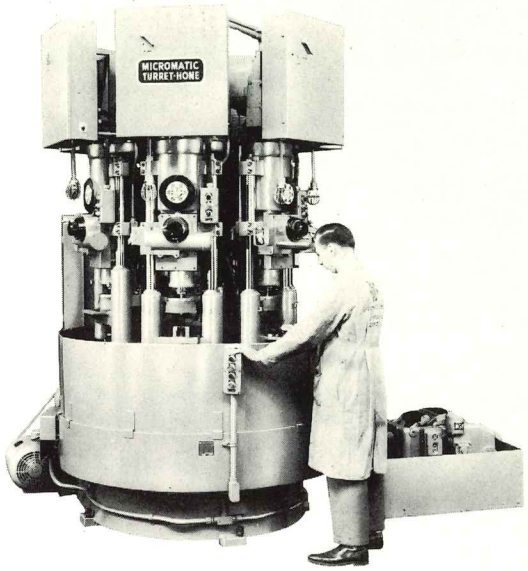
BORE LENGTH / BORE DIAMETER														
Inches	2	2½	3	4	5	6	7	8	9	10	12	14	16	18
1½				737	737	737	737	737	737	737	737	737	737	737
2				737	737	737	737	737	737	737	737	737	737	
2½				737	737	737	737	737	737	737	737	737 430	430	
3				737	737	737	737	737	737	737	737 430	430	430	
4			737	737	737	737	737	737	737	737 430	430	430		
5		737	737	737	737	737	737	737	737 430	430	430			
6	737	737	737	737	737	737	737 430	737 430	430	430	430			
7	737	737	737	737	737	737 430	737 430	430	430	430	430			
9	737	737	737	737	737 430	737 430	430	430	430	430	430			
13	737	737	737	737 430	737 430	430	430	430	430	430				
14				430	430	430	430	430	430	430				
24			430	430	430	430	430	430	430	430				
25		450	450	450	450	450	450	450	450	450				
32	450	450	450	450	450	450	450	450	450	470				
40	450	450	450	450	450	450	450	450	470	470				
41		470	470	470	470	470	470	470	470	470				
66		470	470	470	470	470	470	470	470					
	2	2½	3	4	5	6	7	8	9	10	12			

NOTE: MODEL 420. Capacity of the No. 420 (with a distance of 18 inches between the center lines of its two driving cylinders) becomes dependent mainly upon the number of bores being Microhoned simultaneously. (See Guide Specifications for spindle-to-column clearance and maximum stroke capacity.)

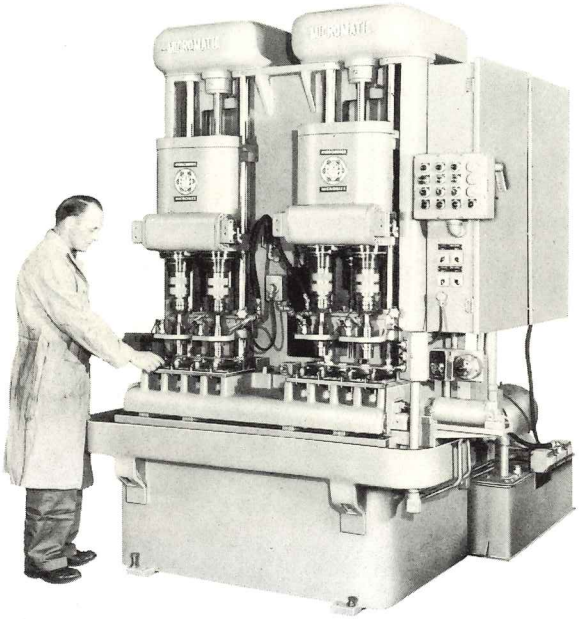
SPECIAL ADAPTATIONS

Because Micromatic equipment is engineered to do a specific job, it is often possible to adapt a machine to meet increased production demands. In obtaining greater production, only the output of the "machine" changes. Size, geometry, and surface finish tolerances of parts are not affected.

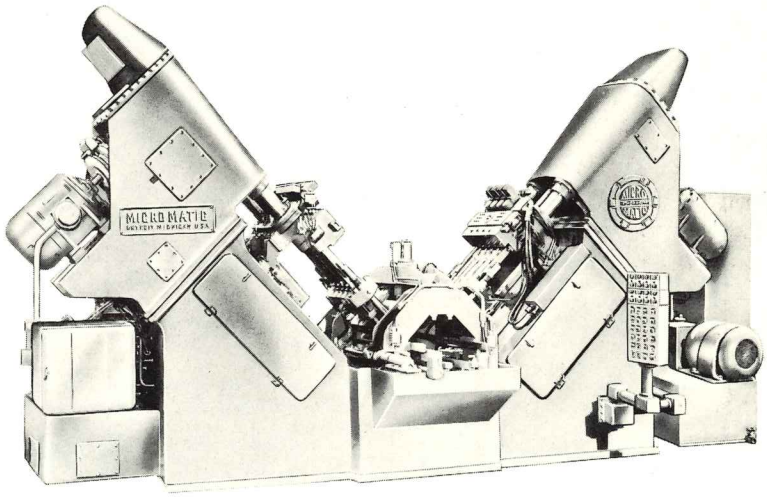
Usually, the new version is a combination of two or more of the original units. Illustrated are just a few examples of special adaptations.



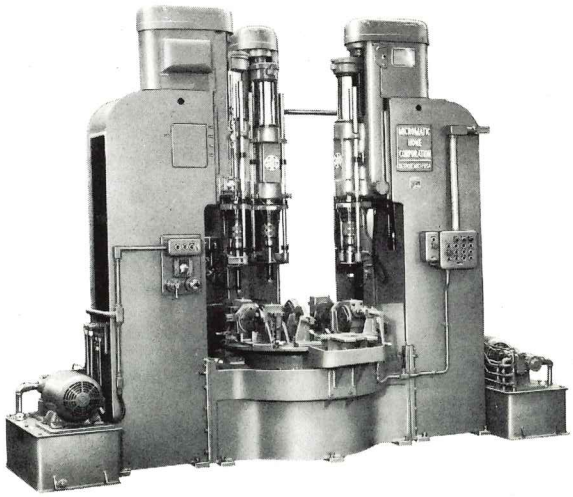
736-6—Turret-Hone composed of six 736 units mounted on a base that rotates continuously.



710-4—A combination of two 710-2 double spindle machines.



420-V—Adapting two, double-cylinder 420 units with special heads of four spindles each, to Microhone V-8 Cylinder Blocks.



730-3—Three 728 units integrated with a rotary table and fixture.

MICROSIZE

Automatic Size Control . . .

Microsize control is a method of automatically holding close tolerances on size. Human factors, such as fatigue, inexperience, or carelessness, which lead to tolerance inconsistencies and errors are eliminated.

Microsize has the following basic features:

A. A means of automatically gaging the diameter along the complete length of the bore during Microhoning and then setting up the "to size" impulse when the bore reaches the desired size.

B. Mechanisms to: (1) automatically expand the tool at a controlled rate; (2) immediately discontinue the cutting pressure when the bore reaches size; (3) adjust for the abrasive used during the Microhoning of each part.

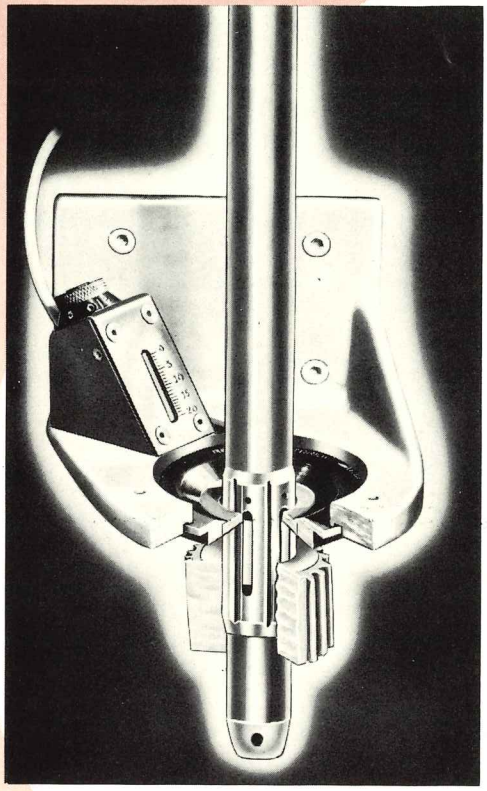
C. A control that picks up the "to size" impulse and directs the machine through the proper sequence of operations to end the cycle.

The two types of Microsize devices, Gage Ring and Gage Bar, differ only in the manner in which the bore is gaged and the "to size" impulse is originated.

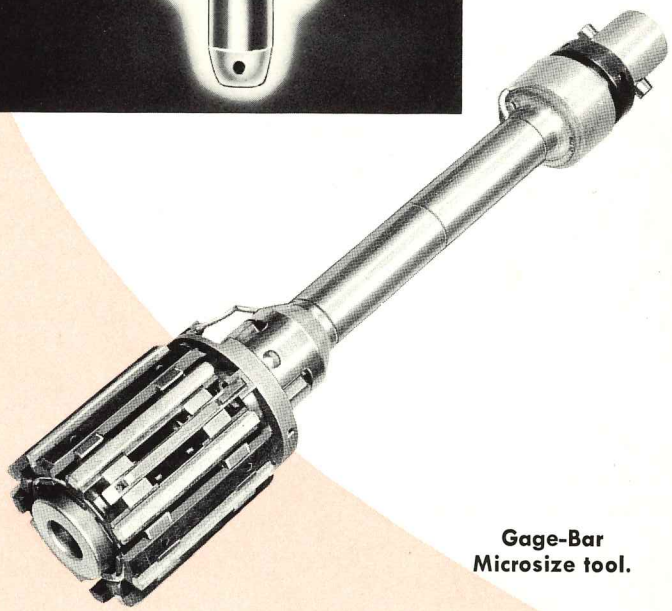
Gage Ring Microsize is used mainly on bores of less than four inches in diameter. The abrasive sticks are molded into plastic shells with plastic tabs extending beyond the ends of the abrasive. As the tool is expanded and stock is removed from the bore, the plastic and the abrasive wear evenly. Because the abrasive is always in contact with the work surface the outside diameter of the abrasive always is exactly equal to the inside diameter of the bore, regardless of stone wear.

A gage ring is positioned above the work part so that, at the top of each stroke, only the upper plastic tabs enter the ring. The inner diameter of the ring is equal to the desired size of the bore; when the bore is to size, the friction of plastic on the ring will cause the ring to turn slightly with the rotation of the tool, closing an electrical contact in an electronic circuit which initiates the sequence of operations to end the cycle.

In Gage Bar Microsizing, used in bores over 2½ inches in diameter, the bore is gaged by two bars that float on the body of the tool. These bars are diametrically opposed and are held against the work surface by a light pressure. Thus, the distance between the bearing surfaces of the bars is always equal to the inside diameter of the bore. The upper ends of the gage bars are hinged to a split ring which carries a pair of electrical contacts on its overlapping ends. As the bore is made larger, the contacts (previously set) are brought closer together and meet when the bore is to size. Their contact prompts the final sequence of operations.



Gage-Ring Microsize set-up.



Gage-Bar Microsize tool.

One of the Micromatic developments that has made Microsize control possible and practical, on any single or multiple spindle Microhoning machine, is the Microdial head. This head not only expands the tool at a controlled rate, but it also compensates for the abrasive used in removing the stock from each bore.

The adjustable feed-out pressure applied to the abrasive is uniform throughout the cycle. The pressure may be adjusted according to the material being Microhoned, the abrasive being used, and the results desired.

HORIZONTAL HYDROHONERS • Series 600 • 6000

For production Microhoning of parts that require a long stroke these two series of horizontal machines supply power and speeds for rapidly removing large amounts of stock.

They may be set up for practically any length bore; the stroke of the 600 series ranges from six to twenty feet, while the 6000 series machine may be built to stroke any length over five feet. The last two digits of the model number designate (in number of feet) the stroke of the machine (e.g., a 6020 model has a 20 foot stroke). In both series the fixture base is built to suit the shape of the work part.

The 600 series machine has a self-contained head that expands the tool hydraulically and, with the Microdial, automatically adjusts for abrasive wear. This series produced the first long stroke horizontal machine which automatically sized the bore. Because this feature is optional, the machine may have manual controls or be set up for semi-automatic operation.

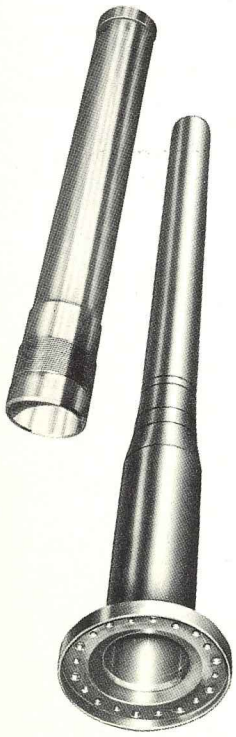
In the 6000 series, the head rides on two rails and is mechanically reciprocated with a gear and a rack. There are no hydraulic connections to be carried between the head and the base of the machine, the latter section being constructed simply of channel iron to reduce cost and weight. The tool is mechanically expanded through a hydro-brake head.

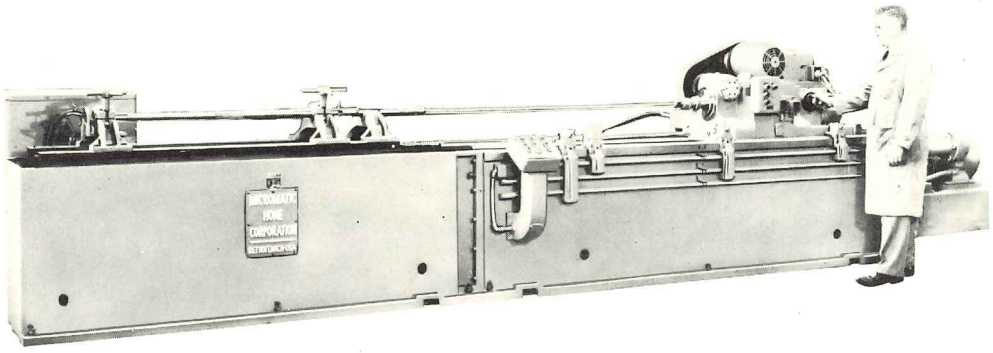
Guide Specifications

606 • 612 • 6020

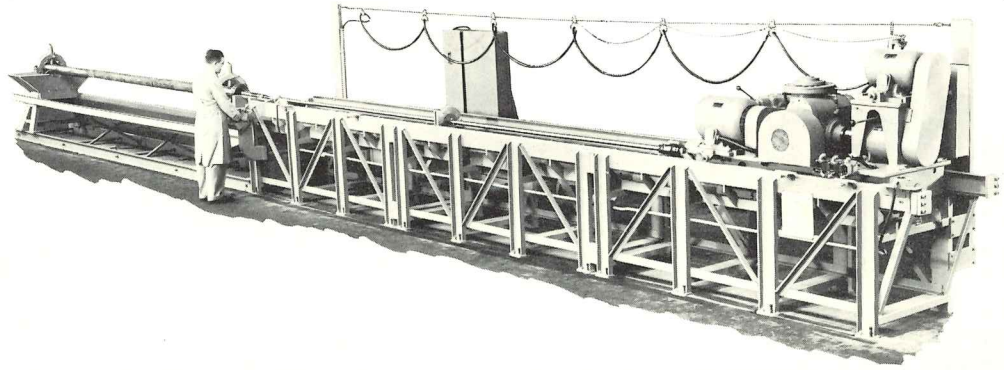
	606	612	6020
Work Capacity, Dia., inches	½ to 10[a]	½ to 10[a]	¾ to 10[a]
Work Capacity, Length, inches	up to 67	up to 140	up to 238
Over-all H x W x L, inches	58x56x264	58x56x384	77x39x373[b]
Height, Spindle to Floor, inches	43	43	43
Spindle Motor, HP—RPM	3 or 5—1800	3 or 5—1800	10—1800
Hyd. Pump Motor, HP—RPM	7½ or 10—1200	7½ or 10—1200	—
Traversing Motor HP—RPM	—	—	5—1800
Spindle Speeds, RPM	35 to 500[c]	35 to 500[c]	44 to 350[d]
Reciprocating Speeds (S.F.M.)	up to 70	up to 70	up to 60
Coolant Tank Cap., gal.	40	40	200
Coolant Tank Motor, HP	½	½	¾
Net Weight, lbs.	8,500	11,800	7,200

[a] *Larger diameter capacity is possible; the extent is dependent upon amount of abrasive area of the tool.*
[b] *This length does not include fixture base which varies according to work part.*
[c] *Single-speed machine; may be set up for any required speed.*
[d] *Machine has four spindle speeds; basic design provides a choice of seven combinations of four speeds; figures given represent total range.*

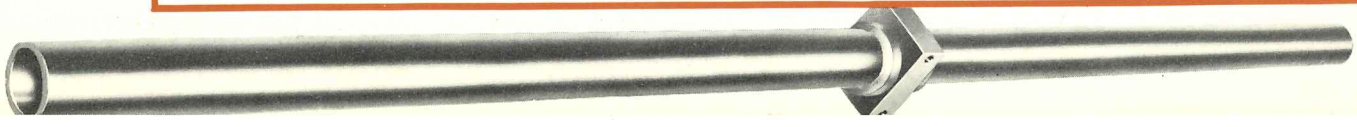




MODEL 606



MODEL 6020



for finishing flat surfaces . . .

MICROFLAT MACHINES

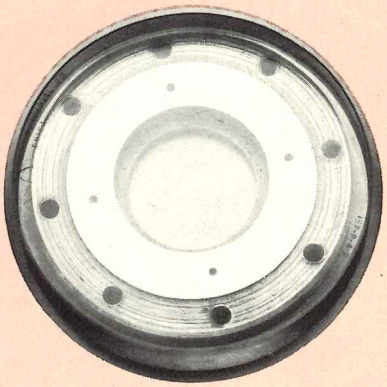
Because Microflat machines produce OPTICAL FLATNESS, uniform SURFACE FINISH, and PARALLELISM, Microhoning is finding increasing application on flat surfaces. Microflat* machines combine the accuracy of lapping with the productivity of grinding.

Tedious hand lapping is eliminated. Surfaces are made flat and developed to any desired finish (as allowed by the structure of the material) in a fraction of the time required by hand lapping methods.

A large area of abrasive is utilized with a light pressure equally distributed over the work surface. Either loose or bonded abrasive of any type or hardness may be used, depending upon the material being processed and the finish desired. (The Micromatic Abrasive Department recommends and supplies the proper abrasive for any application.) The range of the materials which a Microflat can finish embraces practically everything from soft non-ferrous metal to the hardest steel or ceramic.

FLATNESS

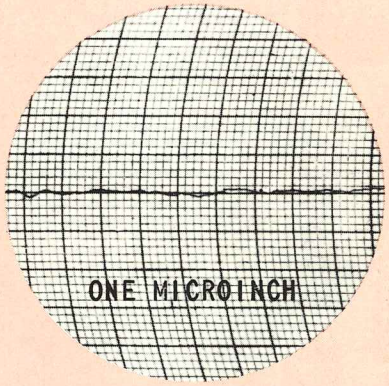
The work piece both rotates and oscillates across a rotating finishing plate, emulating the varying motions that a mechanic makes when hand lapping. Surfaces are made flat within one light band (11.6 millionths of an inch).



SURFACE FINISH

Any type of functional finish may be developed. The proper finish is an especially important feature of surfaces which must seal. When two surfaces are to be bolted together without a gasket, and must hold a seal against high pressure or vacuum, the finish must be coarse enough to permit a mating of the surfaces.

If the surfaces are to move in relation to each other, the finish should be as fine as possible to reduce friction and wear. By use of the proper abrasives and plates, finishes of one microinch or finer can be generated.

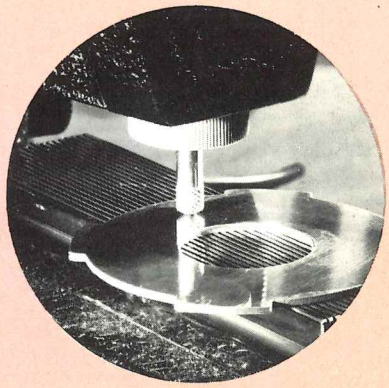


PARALLELISM

Parallelism between opposite surfaces of a part is obtained by simultaneously finishing both surfaces on a double-surface Microflat machine. The motions of the plates and the parts are so arranged that both surfaces receive the same amount of abrading action.

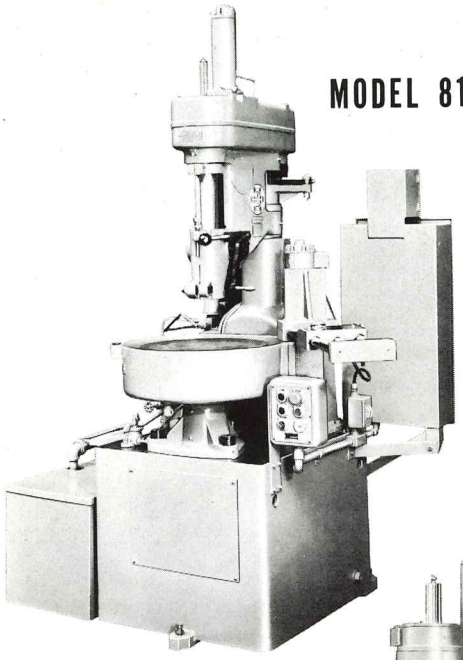
The opposite surfaces of many parts (number dependent upon size) can be made parallel at the same time, within .0001 of an inch tolerance. Flatness and thickness tolerances also are held and duplicated in all work pieces.

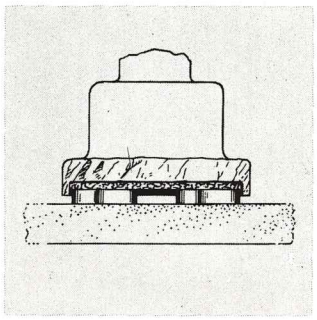
*REGISTERED U. S. PAT. OFF.



SINGLE SURFACE MICROFLAT MACHINES

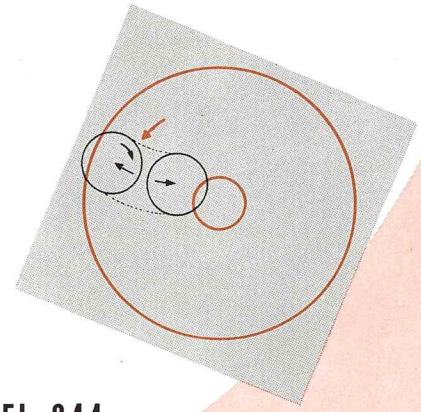
MODEL 818

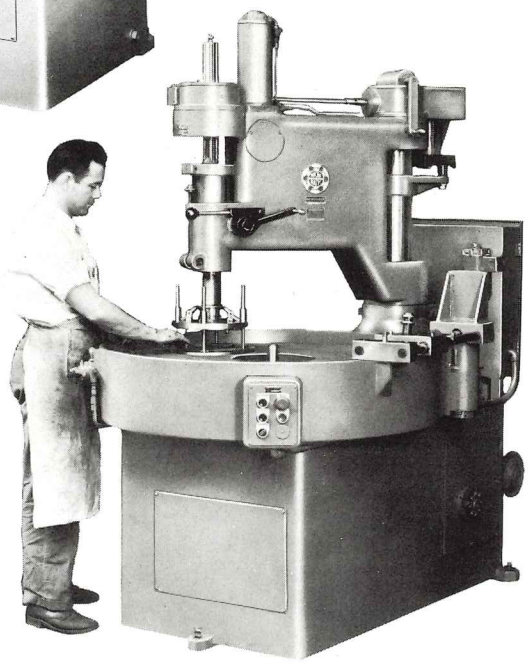




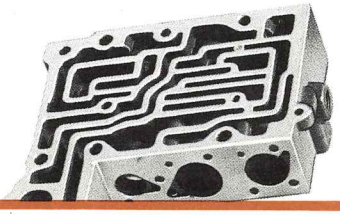
This sketch illustrates how pressure is applied to a number of parts mounted in the spindle plate. The rubber pad assures that the pressure is equally distributed over all the surfaces being abraded.

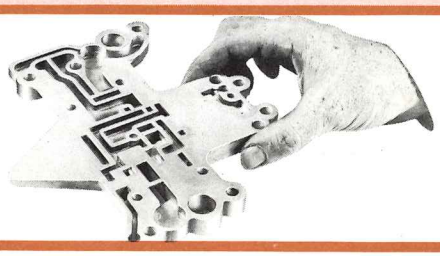
When one large part or several small parts are being finished, the direction of the recurring motions are as diagrammed. The wheel rotates; the work pieces are held in a carrier that rotates and oscillates while stroking across the edges of the wheel. Thus the abrading action is equal over the full surface.





MODEL 844





Guide Specifications

818 • 844

	818	844
Maximum Plate Diameter, inches	18	44
Maximum Work Diameter Capacity, inches	7	20
Oscillation, Stroke, inches	0 to 7⅛	0 to 21½
Over-all Height x Width x Length, inches	91x43*x61	88x48**x82
Floor to Plate Guard, inches	41	40
Motors, HP—RPM	3—1800	3—1800
Net Weight, lbs.	2500	6000

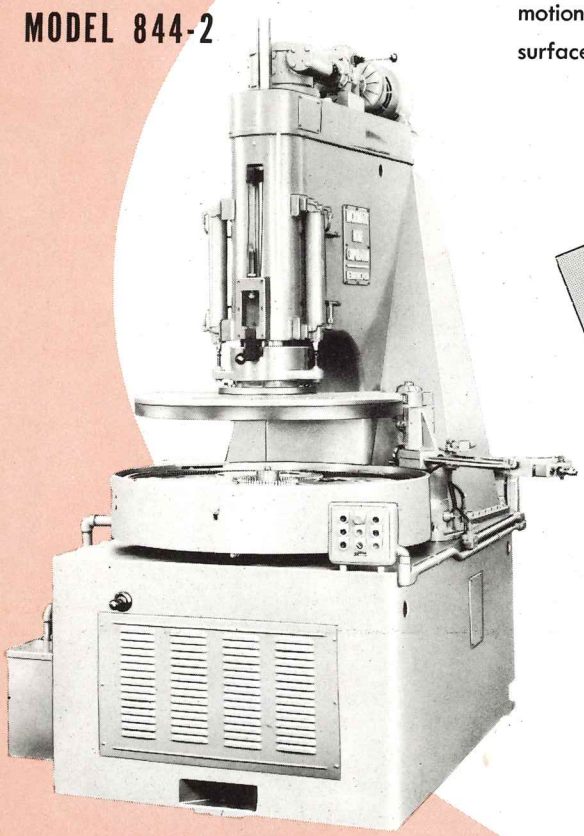
**This dimension does not include dresser; with dresser add 8 inches for carrier swing clearance.*

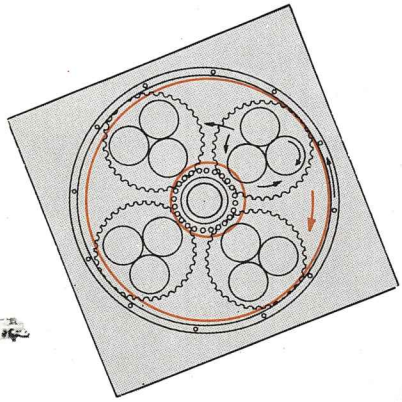
***Without dresser; with dresser add 12 inches for clearance.*

DOUBLE SURFACE MICROFLAT MACHINES

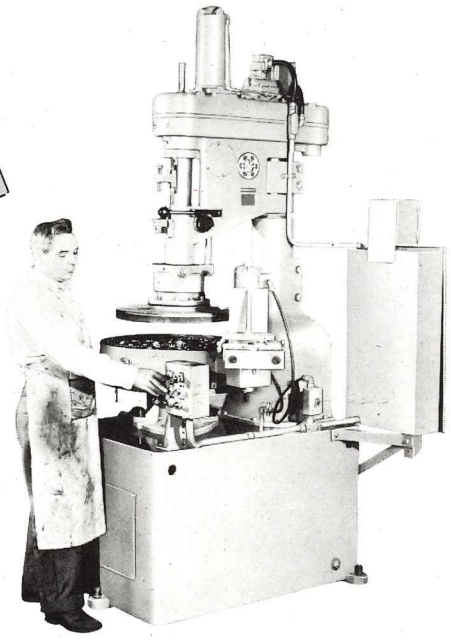
The two abrasive wheels, one above and one below the four carrier rings in which the parts are carried, rotate in the same direction but at slightly different speeds. A chain turns the carrier rings about a stationary gear in the center of the wheels; the parts rotate about their own centers and around the centers of the wheels. This multitude of motions breaks up the travel path of the parts and helps to generate flat, parallel surfaces . . . eliminating the tendency of the parts to tip or over-cut at the edges.

MODEL 844-2





MODEL 821-2

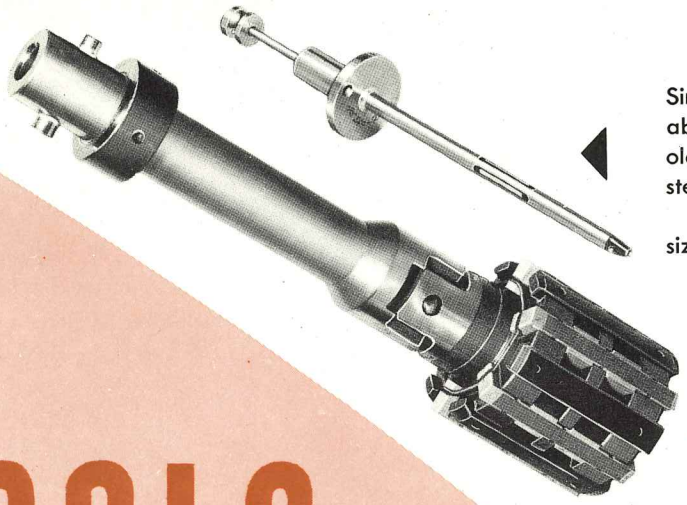


Guide Specifications

821-2 • 844-2

	821-2	844-2
Maximum Plate Dia., inches	21	44
Max. Work Dia., Capacity, inches	3½	7¾
Max. Work Thickness, Capacity, inches	4	9
Over-all Height x Width x Length, inches	98x41½x66	124x55*x118
Floor to Plate Guard, inches	43½	49
Motors, HP—RPM	3—1800	(2) 3—1200 (1) 2—1800 (1) 1—1200
Net Weight, lbs.	2700	15000

**This dimension does not include dresser; with dresser add 20 inches for carrier swing clearance.*



MICRO-MOLD TOOLS

Simple and sturdy. A plastic shell is molded onto the abrasive stick. When the abrasive is worn down, the old stick in the tool is replaced with a new one. All steel shells and stoneholders are eliminated.

Plastic tabs on the ends of the stick are used to size the bore automatically; (see Microsize, P. 15).

MICROHONING TOOLS

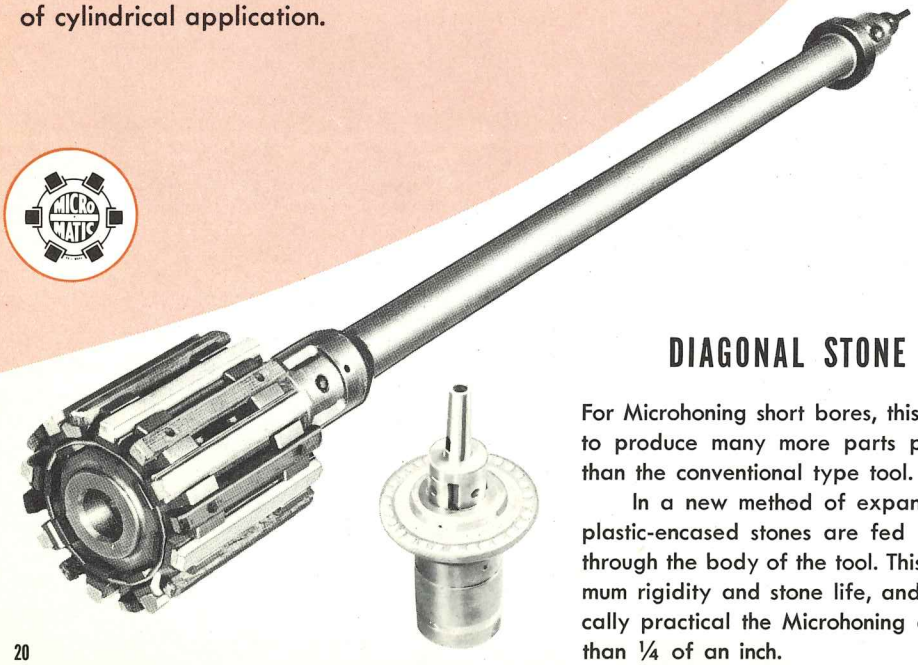
Micromatic's background in the design of honing tools covers 30 years . . . beginning with the earliest pioneering days of the honing process as we know it today. During that period, Micromatic initiated every important honing tool advancement —to provide a complete line of "production-proved" tools. This experience enables Micromatic to continue to excel in designing, building, selling and servicing precision honing tools for every type of cylindrical application.

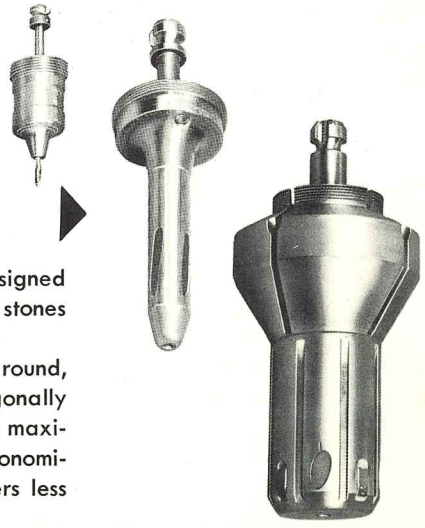
SPECIAL MICRO-MOLD TOOLS

Available for all types of bores—spline, tandem, interrupted, or blind-end.

HYDROBRAKE TOOLS AND ADJUSTING HEADS

Designed so that they can be expanded either hydraulically or by a hand wheel or friction brake on the adjusting head. These tools are available for bores over ¾ of an inch in diameter.





DIAGONAL STONE TOOLS

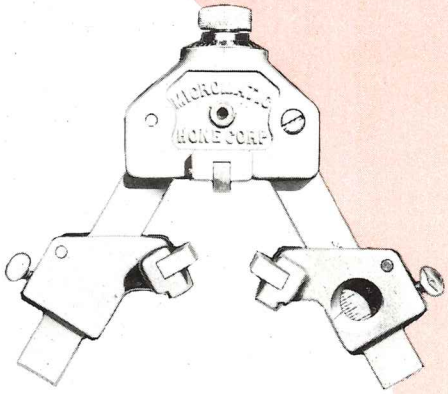
For Microhoning short bores, this tool is designed to produce many more parts per set of stones than the conventional type tool.

In a new method of expansion long, round, plastic-encased stones are fed down diagonally through the body of the tool. This tool gives maximum rigidity and stone life, and makes economically practical the Microhoning of diameters less than ¼ of an inch.

SPECIAL EXTERNAL TOOLS
THE Odee-HONE

Eliminating any need for fixturing, the adjustable Odee-HONE is suitable for Microhoning any outside surface from ½ of an inch to 2½ inches in diameter. With the work piece mounted in a lathe or drill press, the tool is manually stroked along the rotating part.

Several thousandths of an inch stock can be removed while holding diametric size within .0001 of an inch tolerance.



UTILITY TOOLS

For use on any type of machine or electric drill; designed for general purpose, low production, service or reconditioning work. With oversize stone holders and expansion pins, these tools may be used for a wide range of bore diameters.

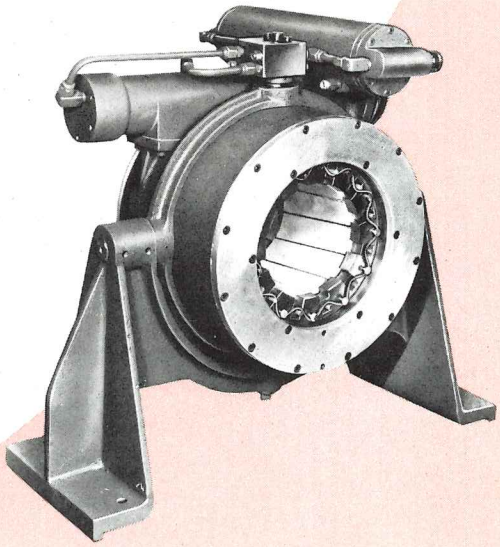
TUBING TOOLS

For bores of any length and diameter. By mounting a series of bands of abrasives in the body of the tool, tubing and gun barrels 75 feet long can be Microhoned.

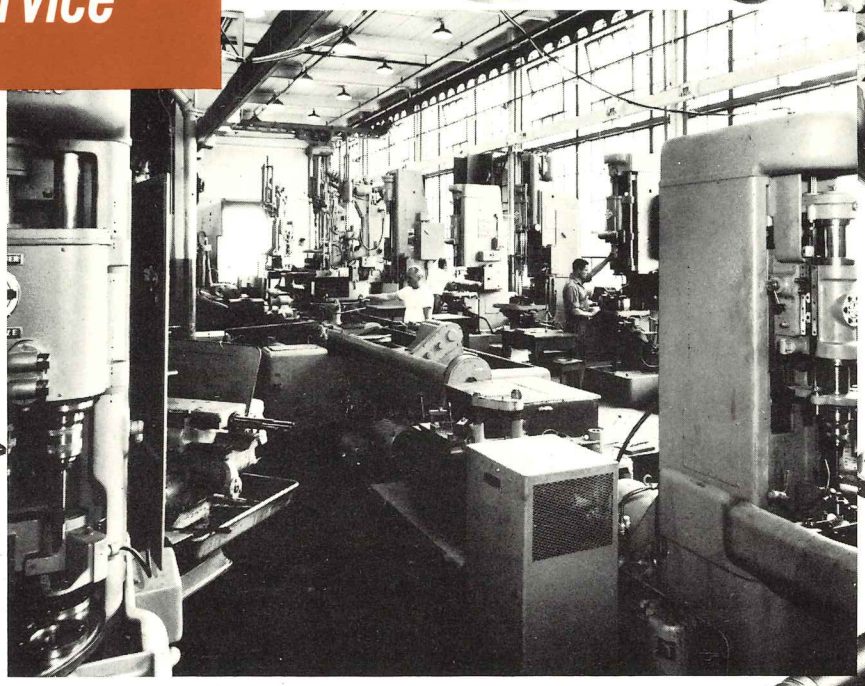
LARGE DIAMETER EXTERNAL TOOLS

Used on a horizontal machine to Microhone quills, bars, or piston rings. Forming a rigid ring around the part, the stones are forced in by a tapered sleeve to generate a true cylindrical surface without waves, flat spots, or chatter.

The work part is rotated and reciprocated through the stationary tool.



JOB MICROHONING *Service*



For the industrial processors who are not equipped or who find it inconvenient to do their own Microhoning, Micromatic offers Microhoning service in its own shop. Cost for the service is based generally on an hourly rate, although a piece or a flat rate may be agreed upon.

At the present time, job Microhoning is available at the Detroit plant, the Los Angeles branch, and Micromatic Hone Limited in Brantford, Ontario, Canada. At the latter two locations service has just recently been offered and, until further equipment is received, job acceptance is limited to certain types of work. However, the service at Detroit is complete. Flat surfaces, long tubing, and all sizes and types of cylindrical work can be Microhoned within a relatively short time.

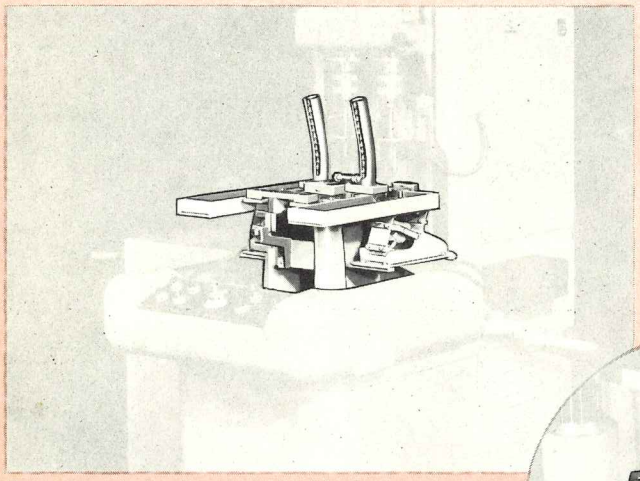
Just contact the Sales Department for more information concerning your specific job. The phone numbers are: Detroit, WEbster 3-7835; Los Angeles, ANgeles 1-0309; Brantford, 33166.

Micromatic Microhoning Fixtures

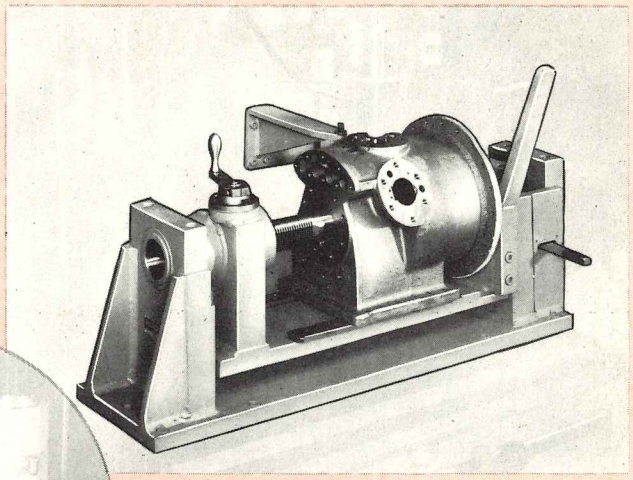
The primary function of the fixture is to hold the part in proper relationship to the tool. Design of the fixture depends upon the part to be Microhoned, the machine and tool with which it is to be used, and the accuracy and production required.

For example, not only must the fixture provide the proper float when a rigid tool is used, but it also must hold the part against the torque and reciprocating motion of the tool.

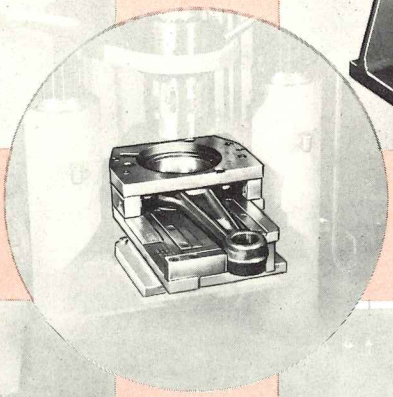
Every fixture embodies the latest automatic controls and simplified handling techniques. Illustrated on this page are just a few examples of hundreds of fixtures designed for specific applications.

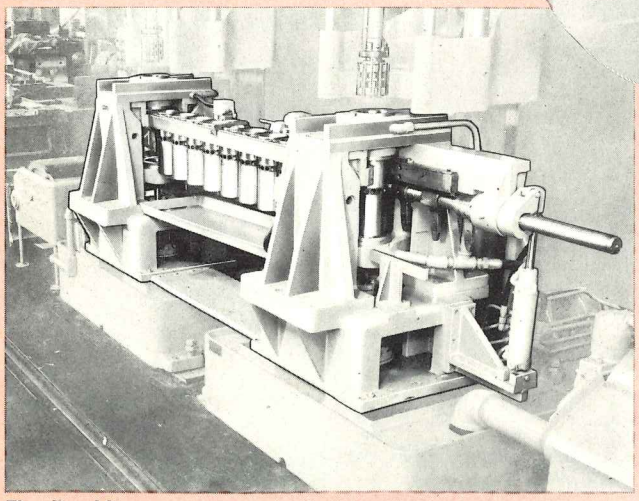


An automatic loading and ejecting fixture on a double spindle Model 705-2 Hydrohoner. This type of fixturing is used for high production of pinion gears.



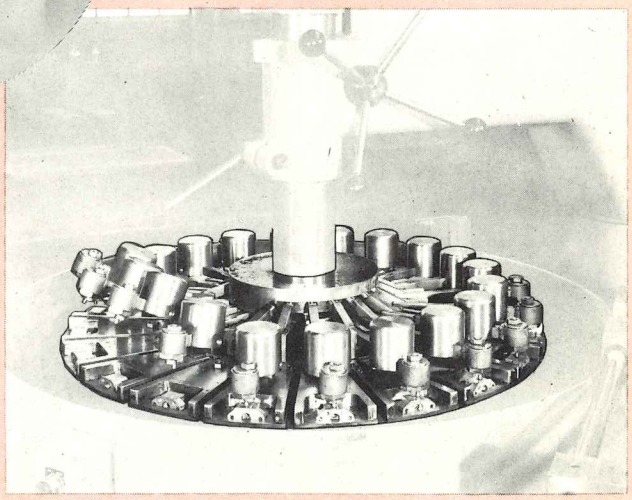
This fixture is designed for aligning a number of compressor block cylinder bores with the machine spindle, without removing the block from the machine. As the fixture is rotated the part moves laterally to bring the other bores of the cylinder into alignment.





The diesel liners are automatically located and clamped as they are moved, from left to right, along the rails of the fixture which is synchronized with the cycle of the double-column machine. This fixture may be set up either for progressive Microhoning (roughing at the first station and finishing at the second) or for finish-Microhoning by both spindles.

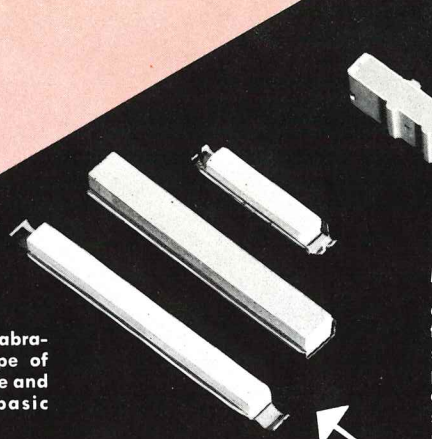
A simple fixture used in Microhoning connecting rods. The rod floats between two parallel plates to align itself with the spindle and tool.



A new continuous-feed fixture on a Model 844 Microflat machine. A cam automatically releases these automotive transmission parts as they pass the operator, permitting him to load and unload without stopping the machine.

Microhoning Abrasives

In order to adapt the abrasive sticks to any type of tool, they are cut to size and supplied in three basic forms:



MICRO-MOLD

a plastic shell is molded onto the abrasive, with the expansion angle formed on the plastic bottom opposite the abrasive. A steel-reinforcing strip is molded in the plastic under the abrasive.

MOUNTED IN METAL SHELL

for use in larger diameter tools. The soft shell is pressed or clamped into the stoneholder.

UNMOUNTED

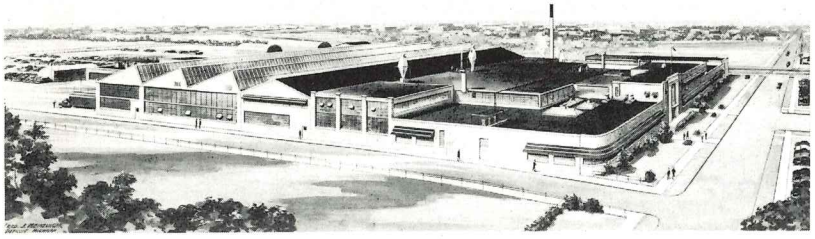
sticks are cemented directly into steel stoneholders.

GUILFORD, CONN.

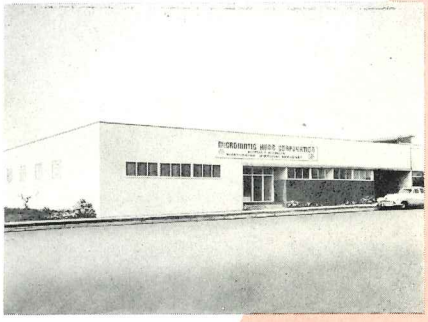
PENDLETON, IND.

BRANTFORD, ONT., CANADA

A combined area of approximately 28,000 square feet is devoted exclusively to abrasive processing and service in strategically located plants in the United States and Canada.



MAIN PLANT AND ABRASIVE HEADQUARTERS, DETROIT, MICH.



LOS ANGELES, CAL.

Micromatic abrasive facilities are the most extensive in the honing field. Included in the nearly one-half million dollar inventory of stones are every known type of Microhoning abrasives being used regularly. These stones are inspected, treated and processed by Micromatic to insure the greatest consistency and maximum life.

Aluminous Oxide and Silicon Carbide sticks are available in any standard grading or type of bond. Over 6000 different types, grades, and sizes are warehoused and can be readied for immediate delivery. Special stones or unusually large orders of standard types can be processed and delivered in a period of about eight weeks, under normal conditions.

After a usage pattern is established, a stock of the particular abrasive is kept in the warehouse nearest the job. Four processing plants and warehouses in the United States, and three in foreign countries, are maintained to provide a continuous supply.

In addition to Detroit, the domestic locations are: Guilford, Connecticut; Pendleton, Indiana; Los Angeles, California. Foreign sources include: Milano, Italy; Leicester, England; Brantford, Ontario, Canada.

Behind Micromatic stand the three largest abrasive manufacturers in the world, Carborundum Company, Norton Company and Bay State Abrasive Products Company. Their world-wide facilities and constant research, combine with Micromatic's efficient Microhoning applications, to pioneer the latest advances in abrasive composition and design.

to help you . . .

STANDARDS In order to gain maximum safety and ease of maintenance in the use of its equipment, Micromatic follows accepted hydraulic, electrical, and pneumatic standards. Whenever possible, these standards conform to the Joint Industry Conference (J.I.C.) and the National Machine Tool Builders Association codes.

However—because Micromatic equipment is individually engineered—these codes can be modified to suit your own needs and specifications. All requirements should be made known in your request for quotation; include such details as the electrical power supply available, provisions for unusual conditions. . . .

PROPOSAL INFORMATION When requesting a quotation on equipment, a complete description of the part to be Microhoned prevents misunderstandings and permits faster service. The following information should be provided:

- ★ blueprint or sketch, giving dimensions and physical characteristics (contour, ports . . .)
- ★ kind of material
- ★ hardness of material
- ★ amount of stock to be removed
- ★ operation immediately preceding Microhoning
- ★ finish desired (microinches)
- ★ tolerances for diameter, roundness, taper
- ★ production required

Also, if the request is for a tool quotation, the machine on which the tool is to be used should be adequately identified.

Send all necessary information to:

PROPOSAL ENGINEERING DEPT. Z-4
MICROMATIC HONE CORPORATION
8100 SCHOOLCRAFT AVENUE
DETROIT 38, MICHIGAN

CROSS-HATCH Through research, development and applications, Micromatic is constantly broadening the scope of the hone-abrading process. From what was little more than a polishing operation, honing has been developed into the modern Microhoning process of unlimited potential.

In order to keep you informed of the latest developments in Microhoning, you are invited to place your name on the mailing list of Micromatic's bi-monthly publication, CROSS-HATCH. Information on machines, tools, fixtures, abrasives, and specific applications provide you with the most recent Microhoning trends and, cumulatively, a valuable reference file.

"A FILM REPORT..." Visual presentation of the various factors to be considered in machining load-bearing surfaces is available in "A Film Report on the Generation of Metallic Bearing Surfaces." Effective techniques in ultra high-speed, microscopic, photo-elastic, and Schlieren photography show how various processes affect the surface finish, surface character, surface structure, and accuracy.

This 27 minute, 16mm sound motion picture is offered free of charge for showing before technical, trade, and educational organizations.

In requesting either CROSS-HATCH or the film, please address:

ADVERTISING DEPARTMENT C-1
MICROMATIC HONE CORPORATION
8100 SCHOOLCRAFT AVENUE
DETROIT 38, MICHIGAN

INSTRUCTION MANUAL In addition to "on-the-spot" aid from the Micromatic field engineer in helping you train competent operators on Microhoning machines, you are provided with a complete instruction manual.

Each manual is individually compiled and covers the hydraulic system, mechanical parts, electrical system, setting up and operating instructions, maintenance and service, plus other information necessary for efficient operation. A recommended spare parts list is also included for your convenience.

MICROHONING INFORMATION The Field Engineering Department at the Detroit office is ready at all times to supply you with the answer to your Microhoning questions. This service is available to you whether or not you are a customer and, of course, places you under no obligation. Just write to:

FIELD ENGINEERING DEPARTMENT F-3
MICROMATIC HONE CORPORATION
8100 SCHOOLCRAFT AVENUE
DETROIT 38, MICHIGAN

BRANCHES

Micromatic Hone Corporation
1535 Grande Vista Avenue
Los Angeles 23, California
ANgeles 1-0309

Micromatic Hone Corporation
614 Empire Bldg.
206 So. Main Street
Rockford, Illinois
2-5425

Micromatic Hone Corporation
Micromold Manufacturing Division
Boston Post Road
Guilford, Connecticut
Glendale 3-2723, 3-2724

Micromatic Hone Corporation
Micromold Manufacturing Division
231 So. Pendleton Avenue,
Pendleton, Indiana
700, 701

Micromatic Hone Limited
330 Grand River Avenue
Brantford, Ontario, Canada
33166

REPRESENTATIVES

Domestic

Overgard Machine Tool Co.
234 Commonwealth Bldg.
Denver 2, Colorado
CHerry 3309

Allied Northwest Machine Tool Co.
103 So. West Front Avenue
Portland 4, Oregon
BEacon 1412

Foreign (*Principal agent only in each country*)

Amertool Department
a/c Negroni Hermanos S.R.L.
Peru 707
Buenos Aires, Argentina

McPherson's Limited
546-566 Collins Street
Melbourne, Victoria, Australia

Ing. Wilhelm Doll
Berggasse 21
Vienna IX/66 Austria

Societe Anonyme Isbecque Todd
27 Boulevard Emile Bockstael
Bruxelles, Belgium

International Machinery Co.
(Bolivia) S.A.
Casilla Postal 815
La Paz, Bolivia

Panambra, S.A.
Caixa Postal 5034
Sao Paulo, Brasil

International Machinery Co.
Casilla 107-D
Santiago, Chile

Amertool
Oficina Tecnica para Columbia
Apartado Aereo 982
Apartado Nacional 2083
Medellin, Colombia

Jorgen C. A. Ammentorp
Ingeniorfirma; Teknisk Import
Lygten 5-7
Kobenhavn N.V. Denmark

A. A. Jones & Shipman Ltd.
Narborough Road South
Leicester, England

O. Y. Cronvall, A.B.
E. Esplanaadikatu 22
Helsinka, Finland

Etablissements Burton Fils
16, Place Jacques Bonsergent
Paris Xe, France

Thielicke & Company
Ettlinger Landstrasse
Karlsruhe-Durlach, Germany

Machine Tools (India) Ltd.
Stephen House
Dalhousie Square
Calcutta, India

Ingenieurs-Bureau, Ingenegeren
Vrijburg N. V.
Dagoweg 51
Bandung, Java, Indonesia

S. P. A. Emanuele Mascherpa
Via Pergolesi 20
Milano, Italy

Okura Trading Co. Ltd.
Okura Bldg.
2 Ginza Nichome
Tokyo, Japan

Argostal, S. A.
Calz. San Antonio Abad 3-E
Apartado Postal 2511
Edificio "Juana de Arco"
Mexico D. F., Mexico

R. S. Stokvis & Zonen
Technical Department
Westzeedijk 507
Rotterdam, Netherlands

Kidd, Garrett Ltd.
Little Queen Street
Auckland C. 1., New Zealand

A/SG. Hartmann
Kirkegatan 7
Oslo, Norway

Machine Tools (Pakistan) Ltd.
Nadir House
McLeod Road
Karachi, Pakistan

International Machinery Co.
Casilla Correo 1843
Lima, Peru

G. B. Lontok & Company
P.O. Box 2984
Manila, Philippines

A. T. E. C.
Agencia Tecnica De Maquinas, L. Da
Rue De S. Paulo, 90, 1° E.
Lisboa, Portugal

Porto Rico Iron Works, Inc.
Ponce, Puerto Rico

Sociedad Anonima Llopart
Calle Pedro IV, 205, San Martin
Barcelona 5, Spain

Mekanik Ingenjorsfirma
Regeringsgatan 85
Stockholm, Sweden

Lambercier & Company
Rue de Berne, 63
Geneva, Switzerland

Macit R. Karaca
2 Gumus Suyu Caddesi
Taksim, Istanbul, Turkey

Pesce & Simeone, S. A.
Daniel Munoz 1990/92
Montevideo, Uruguay

S.A.V.E.R. Guinand
Apartado 668
Caracas, Venezuela